Impact of Socioeconomic Status and Community Vulnerability on Treatment Selection and Outcomes in Intermediate and High-Risk Prostate Cancer: A Pathway to Reducing Disparities

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Introduction

Prostate cancer is a major health concern, generating approximately 299,010 new cases annually and the second leading cause of cancer-related death among men in the US. While standard definitive treatments, such as radical prostatectomy or radiation therapy, offer strong survival prospects, the decision-making process and post-treatment outcomes remain deeply influenced by non-clinical variables, including socioeconomic status (SES) and community stressors. This study aims to evaluate the intricate interaction between individual SES and community stressors, measured through the CDC's Social Vulnerability Index (SVI), to understand how these factors influence treatment choices and outcomes in men with intermediate and high-risk prostate cancer.

Methods

Utilizing a longitudinal cohort from a multicenter study, men diagnosed with intermediate and high-risk prostate cancer who received either radical prostatectomy or radiation therapy were examined. Data from the deidentified, geo-coded CaPSURE[™] database provided patient-level demographics, SES markers, and clinical details. This was supplemented with community-level SVI data, assessing vulnerability at the intersection of individual and community stressors. A survival analysis examined how SVI (by themes) correlated with secondary treatments and progression-free survival (PFS). By focusing on treatment selection, the analysis sought to identify intervention points for clinical practice, recognizing the complex relationship between community-level vulnerability and patient-level SES.

Results

The cohort comprised 9,027 men, who were predominantly White (86.47%), Black (9.88%), and Asian/Latino/Other (3.65%), with a mean age at diagnosis of 65.5 years. 75.60% of high-SVI patients were Black, whereas 90.97% of the low-SVI group were White. Education levels varied, with 44.62% of high-SVI individuals having some high school education, while 43.35% of low-SVI individuals had college degrees. SES and SVI factors (education, income, insurance status) did not exhibit strong linear correlations (e.g., education and income showed a moderate positive correlation at r=0.5251), the findings suggest that SES factors operate independently from SVI, impacting outcomes in different ways. Despite the community-level vulnerabilities indicated by the SVI, survival outcomes post-treatment were

largely similar across SVI levels, with the exception of Minority Status & Language (Theme 3), which indicated moderate correlation to survival outcomes (p=0.0764).

Conclusion

The weak correlation between SES and SVI in relation to oncologic outcomes reinforces the notion that social vulnerability impacts decision-making around treatment selection rather than the outcomes of treatment itself. This finding underscores a critical, actionable insight: the focus should be upstream, addressing how both patient SES and community vulnerabilities shape the initial selection of definitive treatment. Future clinical interventions aimed at mitigating these factors at the treatment-selection stage could reduce disparities in prostate cancer care, particularly in community settings.

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